BEFORE

THE PUBLIC SERVICE COMMISSION OF

SOUTH CAROLINA

DOCKET NO. 92-208-E - ORDER NO. 93-8

JANUARY 25, 1993

IN RE: Application of Duke Power Company for an Integrated Resource Plan.	)	ORDER RULING ON IRP, COST RECOVERY PLAN, DSM EVALUATION AND DSM BIDDING

I.

INTRODUCTION

In 1987, the Public Service Commission of South Carolina (the Commission) established Docket No. 87-223-E to develop procedures for integrated resource planning by electric utility companies. By Order No. 91-885, issued October 21, 1991, in Docket No. 87-223-E, the Commission adopted integrated resource planning procedures after a collaborative process involving the Commission's jurisdictional electric utilities, South Carolina Department of Consumer Affairs, Nucor Steel, South Carolina Energy Users Committee, and the Commission Staff. The procedures were clarified by Order No. 91-1002. On April 8, 1992, Duke Power Company (Duke or the Company) filed, pursuant to the IRP procedures, its 1992 Integrated Resource Plan (IRP), which included its short-term action plan (STAP), for Commission consideration. On May 22, 1992, Duke filed its 1992 Demand-side Management (DSM) Evaluation Plan and its Cost Recovery Plan with the Commission.

Duke's filing was duly noticed to the public, and Petitions to Intervene were received from the following parties: South Carolina Pipeline Corporation (SCPC), Steven W. Hamm, Consumer Advocate for the State of South Carolina (the Consumer Advocate), South Carolina Energy Users Committee (SCEUC), Allied-Signal, Inc. (Allied-Signal), and Chester County Natural Gas Authority (Chester County).

Following a series of collaborative meetings involving Duke and the other parties, the parties participating in the Docket and the Commission Staff filed issues lists and prefiled testimony. On July 27, 1992, a Stipulation between Duke and the Commission Staff was filed which stipulated certain issues between the Commission Staff and the Company. During this intervening time period, on August 10, 1992, Duke filed for approval its DSM Bidding Request for Proposals (RSP) Program.

A public hearing was held in the Commission's Hearing Room commencing at 11:00 a.m., Tuesday, August 18, 1992, the Honorable Rudolph Mitchell, presiding. William F. Austin, Esquire, William Larry Porter, Esquire, and Karol P. Mack, Esquire, represented Duke; Mitchell M. Willoughby, Esquire, and Sarena D. Burch, Esquire, represented SCPC; Nancy V. Coombs, Esquire, represented the Consumer Advocate; Arthur G. Fusco, Esquire, and Mark T. Arden, Esquire, represented SCEUC; Caroline C. Matthews, Esquire, represented Allied-Signal, Inc., Metglas Products; and Marsha A. Ward, General Counsel, represented the Commission Staff.

Duke Power presented its testimony and exhibits by way of a

witness panel consisting of Donald H. Denton, Jr., F. Alfred Jenkins, William F. Reinke, William R. Stimart, and James R. Hendrix. SCPC presented the testimony and exhibits of Kevin M. Harper; Nicholas Phillips, Jr. testified on behalf of SCEUC; and Frederick R. Plett testified on behalf of Allied Signal. The Commission had granted the Consumer Advocate's request to present its witness, Paul Chernick, on an alternative date. Pursuant to a letter and Stipulation filed on September 2, 1992, the Consumer Advocate and Duke agreed, with the consent of all parties, that the prefiled testimony of Mr. Chernick would be accepted into the record without further hearing and that certain rebuttal testimony would be allowed to be filed by Duke Power Company. The Stipulation and cover letter also established the opportunity for surrebuttal from all parties. No further testimony was filed by any party after the rebuttal testimony of Mr. Denton was filed on behalf of Duke Power Company.

II.

BACKGROUND

The Commission issued procedures in 1991 requiring the utilities to file Integrated Resource Plans (IRPs). The Commission has jurisdiction to require filing of IRPs by utilities and to require other actions to implement integrated resource planning in South Carolina.

The objective of the IRP process is the development of a plan that results in the minimization of the long run total costs of the utility's overall system and produces the least cost to the

consumer, consistent with the availability of an adequate and reliable supply of electricity while maintaining system flexibility and considering environmental impacts. In conjunction with the overall objective, the IRP should contribute toward the outcomes of improved customer service, additional customer options, and improved efficiencies of energy utilization. Order No. 91-1002, supra.

Pursuant to the procedures, each utility must file a detailed 15 year IRP every three years beginning in April 1992. The IRP filing must contain a statement of the utility's long-term and short-term objectives and how these objectives address the overall objective of the IRP process as stated by the Commission. The filing must also indicate how the utility's resource plans seek to ensure that the utility incorporates the lowest cost options for meeting the consumers' electricity needs consistent with the availability of an adequate and reliable supply of electricity. Some other requirements of the utility's IRP filing include the evaluation of the cost effectiveness of each supply-side and demand-side option, consideration of the environmental costs of the plan, a demand and energy forecast, a discussion of risk assessment associated with the plan, transmission improvements and/or additions necessary to support the plan, evaluation and review of existing demand-side options utilized by the utility as well as discussion of future demand-side and/or supply-side options.

Finally, the IRP procedures require that the Commission review a utility's IRP filing to evaluate the extent of compliance with

the Commission's procedures for the specific purpose of determining whether the plan is reasonable at that point in time. The Commission is also to review and determine whether the options selected and incorporated within the IRP are in compliance with the Commission's procedures and whether such options have been justified by the utility within its IRP filing. In addition, the Commission is to determine whether the costs, incurred over time, resulting from implementing each chosen option are reasonable. The Commission may also review the appropriateness of the Company's implementation process for each option. The IRP procedures provide that a utility may file a cost recovery plan with the Commission for approval.

On April 8, 1992, Duke filed its 1992 IRP with the Commission consistent with the requirements of the Commission's IRP rules. Duke's 1992 IRP filing consists of four volumes. Volume I, the Executive Summary, provides a broad overview of the planning process and the integrated resource plan. Volume II, the Planning Process and Integrated Resource Plan, describes in more technical and quantified detail the stages of the planning process and the resulting plan. Volume II also includes Duke's STAP. Volume III, the Appendices, contains the detailed data, concepts and calculations supporting the analyses in Volume II for both the process and the plan. Volume IV, the Forecasting Supplement, describes and exhibits the equations used to produce the load forecasts.

III.

ISSUES AND EVIDENCE

Based on the testimony, exhibits and evidence received by the Commission during the hearing and the entire record in this matter, the Commission will herein discuss the issues and applicable evidence.

A. Company's Stipulation with Commission Staff

The Stipulation between the Commission Staff and Duke was filed as Hearing Exhibit No. 1 in this Docket during the public hearing. Witness Denton testified that after his direct testimony was filed, Duke reached a stipulation with the Commission Staff which resolves the major issues between Duke and the Staff. (Tr. Vol. 1, p. 110) The Stipulation sets forth the parties' agreement that Duke's 1992 IRP is consistent with the IRP procedures established in Order No. 91-1002.

The Stipulation also requires Duke to fully justify to the satisfaction of the Commission its overall IRP and the resource options included within the plan. The Stipulation sets forth the parties' agreement on the meaning of Commission approval of the IRP.

The Stipulation also addresses recovery of DSM costs. The parties agree that a cost recovery plan is an appropriate issue for consideration in the IRP proceeding. The parties also agree that deferral accounting with carrying cost coverage and subsequent cost of service amortization in a general rate case proceeding is an appropriate accounting mechanism to provide recovery of DSM costs.

The Stipulation sets forth three criteria that should be met before recovery of DSM costs is appropriate.

Paragraph 9 of the Stipulation documents the parties' agreement on a shared savings mechanism. The parties agree that the concept of shared savings is consistent with a 1988 National Association of Regulatory Utility Commissioners (NARUC) resolution and the 1991 Report of the South Carolina Energy Panel. The concept is also consistent with S.C. Code Ann. §58-37-20, an energy bill which the legislature passed in 1992 dealing with conservation and energy efficiency. The Stipulation modifies Duke's shared savings mechanism as proposed in the Company's Cost Recovery Plan and establishes that the need to continue the mechanism will be reviewed in the next IRP docket.

The Stipulation also documents the parties' agreement that use of multiple tests to determine the cost-effectiveness of DSM options is appropriate in order to comply with the IRP procedures established by the Commission. The parties agree that it is not necessary to address the impact of fuel switching on other energy suppliers at this time. The Stipulation sets forth the parties' agreement that Duke's proposed DSM Evaluation Plan is appropriate.

B. Company's Stipulation with the Consumer Advocate

Subsequent to the hearing, on October 9, 1992, the Consumer Advocate and Duke filed a Stipulation citing areas of improvements made by Duke, committing Duke to make further future areas of improvement and seeking approval of Duke's proposed IRP and DSM programs for implementation. The Stipulation recognizes that

Duke's 1992 IRP proposes energy efficient programs and that Duke has expanded its DSM programs to cover all customer classes--residential, commercial and industrial. In its DSM Bidding RFP, Duke recognizes the importance of comprehensiveness, monitoring and evaluation, and compatibility with other Duke programs. The Stipulation states that Duke's avoided cost estimation procedure has some features that are superior to standard utility practice, i.e., Duke reflects the energy benefits associated with the load shape of each DSM program rather than assuming that all DSM has a flat load shape.

Duke made the commitment in its Stipulation with the Consumer Advocate that it will seek to modify any DSM program that is not cost-effective and seek Commission approval to modify, close or cancel the program, including any associated rate or rider, as appropriate. In the future, Duke committed to increase the comprehensiveness of its programs and continue to review its integration methodology annually to ensure that all DSM options are evaluated properly, among other things. Duke further committed to make improvements for its 1993 STAP and beyond in the areas of avoided capacity and energy benefits, screening, future DSM activity, and integration. The Stipulation allows for new or modified DSM program filings and certain information to be filed with such programs and for future collaborative efforts.

C. Duke Power Company's IRP

Duke's IRP process begins with a forecast. Demand-side, supply-side and purchased power options are developed and then

combined in an integration process. The result is Duke's integrated resource plan, the components of which are discussed below:

1. Forecast

Duke witness Denton testified that the peak and energy forecast for Duke's service area is the starting point for the integrated planning process. (Tr. Vol. 1, p. 17) Duke witness Jenkins described Duke's forecasting methodology. The forecasting process at Duke incorporates a variety of statistical and econometric methods and techniques to describe and forecast the relationship between electric demand and energy requirements and various economic, demographic and environmental factors. (Tr. Vol. 1, p. 42) Duke's peak demands and energy requirements track service area economic conditions very closely. The results of the service area economic models are projections for the three key indicators of economic health of the service area. These are real (inflation adjusted) gross regional product (GRP), real total disposable personal income, and employment. These projections serve as critical inputs to the modeling process for system peak demand and energy requirements. (Tr. Vol. 1, p. 43)

2. Demand-Side Planning

Witness Jenkins testified that the demand-side planning process begins with an assessment of the energy consumption patterns in the marketplace and the end-use technologies currently being used by customers. A comparison is then made to assess the potential beneficial impact new technologies or approaches may have

on customer energy consumption patterns. In addition, existing DSM program approaches and technologies are reviewed to determine if changes or enhancements are required for the future. (Tr. Vol. 1, p. 46)

Witness Jenkins described numerous DSM process enhancements underway. Duke is now tracking all DSM program costs. In the forecasting area, the initial phases of end-use analysis for the residential and commercial sectors have been completed. A demand-side management resource assessment is underway which incorporates a major review of technology coupled with end-use load shape data collection. (Tr. Vol. 1, p. 46)

The total diversified peak impact for Duke's existing DSM programs through December 31, 1991 is 1089 MW. (TR. Vol. 1, p. 48) Of the 24 demand-side options reviewed in the 1992 planning cycle, 22 are resource options which fall into three broad categories: energy-efficiency (14), load shifting (1), and interruptible (7). The two remaining options focus on opportunities for electric technologies to aid customers in making environmental quality improvements. The 14 energy-efficient options target areas involving water heaters, refrigerators, freezers, heat pumps, central air conditioners, chillers and unitary systems for air conditioning, indoor lighting, insulation, and motor systems. The seven interruptible options target load control of residential water heaters and air conditioners, activation of standby generators and interruption of industrial processes. The two environmental options target recovery of plating solutions in metal

finishing operations and the reduction of waste water effluent in textile operations. The one load shifting option focuses on residential water heating. (Tr. Vol. 1, p. 48) Twenty-one of the 24 demand-side programs were forwarded to the integration process. (Tr. Vol. 1, p. 49)

Consumer Advocate witness Chernick contended that there were several omissions and deficiencies in the Company's DSM portfolio. Mr. Chernick stated that Duke fails to target DSM market sectors comprehensively, resulting in lost opportunities. Mr. Chernick also testified that Duke ignores two lost-opportunity segments altogether: the non-residential new construction and renovation segment and the industrial process changes in new factories, plant expansion and refurbishment segment. Mr. Chernick indicated that new construction provides opportunities for a wide range of efficiency improvements. Finally, Mr. Chernick alleged that Duke's existing and proposed programs do not adequately cover market segments. (Chernick direct, p. 46)

Witness Denton testified in rebuttal that Duke's DSM programs cover a number of markets and end-users. As the Company expanded its commitments to DSM, Duke concentrated its DSM option design efforts on those markets and end-users where the greatest impact could be achieved. In an effort to avoid discrimination between customer groups, Duke offers programs to as many market segments as possible. For example, Duke concentrates on heating and cooling in the residential sector and lighting, motors and HVAC in the commercial/industrial sectors since these end-uses account for the

majority of energy use. (Denton rebuttal, p. 3)

Witness Jenkins testified that Duke recognizes that lost opportunities for DSM can occur. Duke's marketing representatives maintain an active presence in the marketplace with particular emphasis on the new construction market energy decision makers such as developers, contractors, and architectural and engineering firms. These representatives are charged with conducting a comprehensive analysis of customers' energy needs, recognizing opportunities for any or all of Duke's DSM programs and recommending the best mix of these programs to meet the energy needs of the customer. (Tr. Vol. 1, p. 52)

Witness Denton also testified on rebuttal that Duke has bundled several residential DSM programs together to address the residential new construction market. He noted that Duke has not made the same consolidation in the non-residential construction market because of the large number of variables that impact the design of a new construction program. Duke is conducting a DSM Resource Assessment which will provide much of the data needed to enable Duke to design a comprehensive non-residential new construction DSM program. Witness Denton also noted the diversity in the industrial process market. Duke will continue to evaluate specific industrial process options. Duke has also filed a DSM bidding program which will allow industrial customers to identify many unique DSM opportunities. (Denton rebuttal, p. 4)

Witness Chernick alleged that many of Duke's programs result in cream-skimming. He defined cream-skimming as the acquisition of

easily available inexpensive conservation resources in a manner that renders otherwise cost-effective resources non-cost-effective or more difficult to obtain. He explained that cream-skimming can occur if a program neglects measures that would be cost-effective if implemented at the same time as other planned measures or if a program captures a small amount of inexpensive savings but at the same time renders a larger amount of otherwise cost-effective savings less cost-effective or more difficult to obtain. (Chernick direct, p. 52)

In rebuttal, witness Denton testified that Duke designed its programs to be as cost-effective as possible while covering as many markets as possible. To avoid cream-skimming all cost-effective conservation within a measure is sought at one time. This means higher incentives, which in turn limits the financial resources available to offer other DSM programs. As Duke has expanded its DSM offerings, the Company has deliberately sought to offer a balance of cost-effectiveness programs to all sectors. (Denton rebuttal, p. 6)

Witness Chernick testified that Duke's existing DSM programs do not adequately address market barriers, noting particularly that Duke lacks a mechanism for targeting trade allies. He stated that Duke must work with trade allies to ensure that they have sufficient stocks of high efficiency equipment. By offering incentives to dealers, Duke can raise the efficiency of in-stock equipment. (Chernick direct, p. 60)

Witness Denton testified that Duke has dealt with market

barriers for decades and strives to address barriers in its program design. He noted that one method of addressing barriers is through the use of pilot programs to determine the barriers that exist and ways to overcome them. (Denton rebuttal, p. 4)

Witness Chernick testified that some of Duke's conservation programs have the potential to load build, naming the heat pump sales component of the MAX program. This program increases winter load and total energy usage. He also claimed that the Dual Fuel Heat Pump program is exclusively load-building. (Chernick direct, p. 71)

Witness Jenkins testified that Duke has increased its emphasis toward DSM activities and programs. Duke is in the process of determining the appropriate mechanism to evaluate load building or strategic sales opportunities in relation to the IRP process. The objective is to make sure that strategic sales programs are only pursued when it can be demonstrated that they are in the long-run best interests of all customers. (Tr. Vol. 1, p. 59)

Witness Chernick testified that the Company should encourage electric energy sales increases or shifts only if they are cost-effective and that the Commission should encourage alternative fuels to compete on the basis of cost and quality of service not on marketing advantages and market imperfections. If Duke can demonstrate that an electric heating system is less expensive than a comparable alternative fuel system, on a life-cycle basis, Duke should be encouraged to promote electric heat throughout its

service territory. The gas companies and oil dealers should simultaneously promote efficiency in the use of their own products. (Chernick direct, p. 75)

South Carolina Pipeline witness Harper testified that the Company did not consider the full range of available DSM options in the development of its IRP. He noted that Duke did not mention different gas-related resource options such as gas cooling and gas water heating that can, under certain circumstances, simultaneously benefit both electric and natural gas utilities. (Tr. Vol. 3, p. 17) Witness Harper testified that a utility's IRP process cannot be truly comprehensive without at least considering fuel substitution options on the same basis as other DSM options. (Tr. Vol. 3, p. 19) He recommended that the Commission require the Company to complete a more comprehensive analysis of all of the DSM resource options that are available to it. (Tr. Vol. 3, p. 32) Witness Harper recommended that the Commission consider developing a generic framework for the assessment of important policy issues, as well as for the evaluation of specific fuel substitution opportunities. (Tr. Vol. 3, p. 23)

Duke witness Denton testified that the purpose of Duke's IRP process is to develop a plan which minimizes utility and customer costs while maintaining an adequate and reliable supply of electricity. He stated that the purpose of Duke's DSM programs is to encourage the efficient use of electricity. To that end, Duke's DSM programs are designed to ensure that its customers who choose electric end-uses are motivated to choose those that are efficient.

(Tr. Vol. 1, p. 32) He stated that Duke is required to provide electricity at the lowest reasonable cost (consistent with the other requirements listed in the IRP rule objective) and then the consumer can make his buying decision as to whether he chooses electricity or gas. Mr. Denton opined that it is not the purpose of IRP to dictate end-use fuel sources for the consumer. (Tr. Vol. 1, p. 138) nor does Duke believe it is within the scope of the electric IRP process to consider fuel-switching options. (Tr. Vol. 1, p. 32) In the July 27, 1992 Stipulation the Staff concurred that the current IRP procedures do not specifically address this issue.

Witness Chernick testified that Duke does not provide detailed documentation of its program-specific cost and effectiveness assumptions, nor any supporting evidence for its conclusions regarding the participation achievable at different incentive levels. He noted that, in response to discovery, the Company states that incentive levels are established by the option work teams based on their judgment and experience. (Chernick direct, p. 23)

Witness Jenkins testified that Duke has provided sufficient information about DSM options in Volumes II and III of the IRP. Witness Denton noted that in addition to DSM program information included in the IRP (Volume II), the IRP filing included over 180 pages of DSM information in the appendices. Witness Jenkins noted that for each option, there is a narrative description of its characteristics, objectives and target market in addition to a

comprehensive listing of input assumptions such as load shape impact, numbers of participants, levels of free riders, customer and utility cost data and financial parameters. He also testified that Duke will file new and modified DSM programs for Commission approval. (Tr. Vol. 1, p. 56; Denton rebuttal, p. 2)

The Company is expanding its DSM program and has implemented, piloted or considered a large number of options. Although the Consumer Advocate offered a number of criticisms of Duke's process, the Commission notes that the Company has numerous improvements underway including end-use forecasting, DSM cost tracking, DSM evaluation and resource assessment. Additionally, the Stipulation filed by Duke and the Consumer Advocate recognizes Duke's efforts in promoting DSM and addresses many of the concerns of witness Chernick.

3. Supply-Side Planning

Witness Hendricks testified that the supply-side planning process is initiated with an up-to-date review of available technologies. This includes review of Electric Power Research Institute and other industry data, research by other utilities, and research conducted by Duke. Certain technologies which are not feasible in the Duke service area are eliminated. Duke develops schedule, cost, and performance data for the remaining technologies. These remaining technologies then undergo a screening analysis that indicates which technologies are low cost or cost competitive over a range of capacity factors. The technologies selected by the screening analysis are then passed to

integration for evaluation using expansion planning modeling techniques. (Tr. Vol. 1, p. 95)

A total of 33 technologies were initially considered, ranging from conventional technologies such as pulverized coal, combustion turbines, combined cycle, and nuclear to emerging technologies such as advanced batteries, solar, and photovoltaics. (Tr. Vol. 1, p. 96) Conventional pulverized coal, atmospheric fluidized bed combustion, circulating fluidized bed combustion, light water nuclear reactors, pumped storage hydro, combustion turbines, combined cycle, diesel generators, phosphoric acid fuel cells, and advanced battery technologies passed the detailed screening process and were forwarded to the integration process. (Tr. Vol. 1, p. 97)

Two additional topics which impact supply-side planning are the recent Clean Air Act Amendments (CAAA) of 1990 and externalities. Mr. Hendricks discussed these issues in his testimony. Title IV of the CAAA requires that by the year 2000 electric utilities reduce aggregate annual emissions of sulfur dioxide (S02) by approximately 10 million tons and nitrogen oxides (NOx) by 2 million tons compared to the base year 1980. The primary impact of this requirement will be on Duke's eight fossil stations.

Witness Chernick testified that Duke's avoided cost analysis neglects certain costs of compliance with the CAAA. He noted that the Company declined to provide documentation on its compliance plans. Witness Chernick stated that the Company did not reflect the value of sulfur allowances in its avoided cost modeling.

(Chernick direct, p. 43)

Witness Hendricks testified that Duke is taking advantage of the interim time period to develop a strategy to meet Phase II requirements of Title IV and to follow the development of remaining Phase II requirements. He testified that the preliminary compliance plan was an input to the IRP process and that the final compliance plan may be significantly different based on development of regulations and technologies. (Tr. Vol. 1, pp. 98-99) Further, Mr. Hendricks stated that Duke is following the allowance trading market and will consider it as one of a number of methods for compliance with CAAA. He added that Duke's IRP process will consider CAAA compliance as one aspect of its overall plans and assure that the value of allowances is prudently considered in relation to other costs. (Tr. Vol. 1, pp. 103-104)

Witness Hendricks testified that Duke has researched a variety of reference documents on the subject of environmental externalities and Duke believes its present methods are appropriate. Duke plans to continue to monitor and evaluate developments regarding externalities. Duke will continue to include the costs of environmental compliance in its assessment of resource options. Further, Duke will continue to qualitatively consider environmental effects in resource assessments. (Tr. Vol. 1, p. 99)

Witness Chernick did not agree with the methodology which Duke used to account for externalities. He stated that even with more stringent environmental controls on emissions, there will still be

externalities associated with electric production. (Chernick direct, p. 44)

South Carolina Pipeline witness Harper testified that the Company has not fully addressed the issue of externalities in its IRP. (Tr. Vol. 3, p. 18) He identified several important policy issues related to externalities including the appropriateness of including externalities in IRP, which externalities to include, which approach to use to incorporate externalities, and quantitative versus qualitative consideration. He noted that a number of alternative methods have been used by various parties and regulatory bodies to estimate the economic value of externalities. (Tr. Vol. 3, p. 29) He recommended that the Commission require the Company to treat externalities in a more comprehensive and quantitative manner. He suggested the Commission conduct a series of technical workshops on the issue. (Tr. Vol. 3, p. 33)

SCEUC witness Phillips testified that great care must be taken in considering externalities beyond those that are rather obvious such as zoning ordinances, land-use restrictions and cultural factors. He noted that factors such as air or water emissions are extremely difficult to quantify. He testified that it is reasonable to assume that the legislative bodies and agencies establishing pollution control requirements have taken these factors into account in developing the standards that must be met. (Tr. Vol. 3, p. 63) Duke's qualitative treatment of externalities recognizes these factors.

4. Purchased Resources

Witness Reinke testified that an integrated resource analysis would not be complete without determining whether purchased resources from non-utility generators (NUGs) or other utilities would be attractive to postpone other resources. Purchased resources which appear to be economically attractive and technically viable are pursued further through negotiations with the entity making the proposal. Once a contractual agreement is reached, the purchased resource is included in the integrated planning process. As of January 1992, there were 57 NUGs on the Duke system. These consist of commercial or industrial customers who operate facilities to supply a portion of their own needs, hydro facilities, and customer installations which sell excess energy to Duke. The total firm capacity of facilities selling excess or total generator output to Duke is approximately 55 MW. (Tr. Vol. 1, pp. 65-67)

5. Resource Integration

Witness Reinke testified that Duke makes extensive use of computer models which simulate power system operation. First, Duke uses the models to determine an optimal Base Supply-Side Plan, which is the plan that produces the lowest total present worth of revenue requirements over the study period considering only supply-side options. The Base Supply-Side Plan resulting from the 1992 IRP process included about 3500 MW of combustion turbine capacity from 1992 to 2006, and 2400 MW of coal capacity from 2003 to 2006. (Tr. Vol. 1, p. 68)

Witness Reinke explained that DSM option integration begins with the economic evaluation of each DSM option in the Single Option Analysis. Single Option Analysis evaluates each of the DSM options one at a time against the Updated Plan and determines the overall benefit of each option. Cumulative Option Analysis uses the Single Option Analysis results to reevaluate the DSM options in ranked order. This method recognizes the synergism which occurs among options and with the existing system. Several planning models are used to determine each DSM option's benefits and costs by determining the production and capacity impacts. These impacts along with financial data associated with each option result in the computation of a Benefit/Cost ratio. This Benefit/Cost ratio is provided for several different economic tests. (Tr. Vol. 1, p. 69)

Witness Reinke described four economic tests in his testimony. The first of these is the Participant Test which evaluates the benefits for potential participants compared to their costs. The Total Resource Cost (TRC) test determines the benefits to all customers compared to the total costs. The Utility Cost test (UCT) measures the impact on utility bills resulting from the implementation of the program. The Rate Impact Measure (RIM) determines the impact on electricity prices for implementation of a program. Programs that fail this test are not screened out of the process at this stage of the evaluation. The intent of this test is to note any potential adverse impact on rates from implementation of an option and to undertake option redesign if these adverse impacts appear too severe. (Tr. Vol. 1, p. 69)

Witness Reinke testified that using the Benefit/Cost ratios from the Cumulative Option Analysis, the supply-side options from the Base Supply-Side Plan and purchased power agreements, alternative plans are developed. (Tr. Vol. 1, p. 69) Four alternative plans, including the Base Supply-Side Plan, were developed for the 1992 IRP.

The results obtained to this point from the integration process are for a fixed set of conditions. The alternative plans had not been subjected to an evaluation which considered uncertainties in the underlying assumptions. That analysis was performed in the Risk Assessment phase of the study. Witness Reinke explained that risk assessment addresses, through both objective and subjective analysis, the risks and uncertainties of forecasting the future. These uncertainties could be recognized through examinations of various individual assumptions. Studying a series of alternative plans under these various conditions makes it possible to identify those plans which would remain attractive in an uncertain future. (Tr. Vol. 1, pp. 70-71)

Witness Chernick testified that, in principle, Duke's modeling has some features that are superior to standard utility practice. In particular, Duke reflects the energy benefits associated with the load shape of each DSM program, rather than assuming that all DSM has a flat load shape. The Company also models explicitly the reliability benefits of each DSM option, taking into account the effect of each program's load shape as well as the constraints on the operation of load management and interruptible options.

However, witness Chernick stated that the use of sophisticated modeling does not eliminate the need for avoided cost estimates. (Chernick direct, p. 30)

Witness Chernick testified that he was not proposing that Duke abandon use of production costing models. For final program screening, production costing models are a valuable tool. It is the Consumer Advocate's position that Duke's detailed modeling should be corrected and better documented, not discarded. Avoided cost estimates are needed to facilitate measure screening, to assist program designers in understanding the features of programs that are most valuable, and to allow for the screening of customer DSM projects. They are also needed to guide DSM bidders. (Chernick direct, p. 31)

Witness Jenkins testified that DSM options undergo a preliminary analysis in a software tool called DSManager. The use of DSManager is a superior approach compared to simplified avoided cost estimates based on limited pricing periods. (Tr. Vol. 1, p. 55) Witness Reinke testified that Duke uses detailed analytical models which recognize each DSM program's contribution to capacity and energy reductions with consideration for reliability. (Tr. Vol. 1, p. 75)

Witness Chernick testified that the Company did not screen several existing residential programs. Mr. Chernick noted that Duke asserts that the programs were previously screened. Witness Jenkins testified that Duke did not feel it was necessary to reanalyze existing programs in this IRP where there were no changes

in the input assumptions or levels of program activity. However, Mr. Jenkins noted that Duke plans to evaluate existing programs in the current planning cycle. (Tr. Vol. 1, p. 53) Witness Chernick stated that an earlier screening was of no value for this proceeding since it is likely to have occurred prior to issuance of the Commission procedures on IRP and to have considered only the RIM test. (Chernick direct, p. 13) He claimed that some of these programs promote the choice of electric over fossil heat and called for Duke to demonstrate that these programs are economically justified. (Chernick direct, p. 13)

Witness Denton testified in rebuttal that the programs which were not analyzed in the 1992 IRP process were cost-effective in the 1991 process and results would have been very similar in the 1992 process. (Denton rebuttal, p. 10) Witness Chernick testified that the Company's reliance on the RIM test to rank options for the Cumulative Option Analysis may result in a suboptimal selection of DSM programs. (Chernick direct, p. 16)

Witness Denton testified on rebuttal that there was no suboptimal selection of DSM options as proposed by Mr. Chernick. Duke used the RIM test for ranking DSM options in the single option analysis. In the 1992 IRP process, no DSM options were screened out at this stage of the process. (Denton rebuttal, p. 10)

Consumer Advocate witness Chernick testified that the utility should rely primarily on the TRC, stating only the TRC test will consistently reflect the true value of efficiency programs. Witness Chernick stated that any measure that passes the TRC screening is

worth pursuing. (Chernick direct, p. 8) He testified that the Commission IRP rules require primary reliance on TRC, quoting Rule B(7) of the procedures established in Order No. 91-1002: The utility shall propose an IRP which minimizes total resource costs to the extent feasible, giving due regard to other appropriate criteria such as system reliability, customer acceptance and rate impacts. (Chernick direct, p. 12) SCEUC witness Phillips testified that the participant and the non-participant (or RIM) tests provide the most useful information. He stated that the non-participant test is the only test that considers all relevant information about the cost of the DSM measure to utility ratepayers and the impact of the measure. (Tr. Vol. 3, p. 70)

Witness Denton testified that Duke believes that use of any one test is inappropriate. He noted that Rule B.6 of Order No. 91-1002 states that no single test is always appropriate for all situations. Witness Reinke testified that the California Standard Practice Manual, a widely used industry guideline, discusses advantages and disadvantages of each test and encourages the use of multiple tests in determining cost-effectiveness. Witness Denton testified that the Manual acknowledges that use of multiple tests is appropriate and that Duke agrees. He noted that the Commission Staff also acknowledges in a stipulation with Duke that multiple tests are appropriate to evaluate DSM options. He also testified that no one test can evaluate all the benefits or costs of a DSM option. The TRC test disregards the level of rebates and incentives, an important component of DSM costs, and results in no

consideration of rate impact. Duke uses all tests and evaluates the trade-offs between the tests. Duke uses multiple tests to evaluate the impact on all rate classes and customers, not just those that participate in the DSM programs. Duke believes this balanced approach is appropriate. (Tr. Vol. 1, p. 31; Denton rebuttal, p. 7; Tr. Vol. 1, p. 73)

Witness Chernick testified that Duke does not document its "balanced approach"; it does not indicate how trade-offs between the tests are assessed and decisions made. (Chernick direct, p. 11) Furthermore, he contended that Duke does not fully apply the TRC test. Duke excludes any value for environmental effects and otherwise understates avoided costs. Duke also ignores the effect of electric DSM on consumption of non-electric energy or water. However, witness Chernick noted that this "error" may not have made any difference in the 1992 plan. (Chernick direct, p. 11)

Witness Chernick testified that Duke's DSM planning process does not seek to maximize net benefits. (Chernick direct, p. 15) Among those competing mutually-exclusive DSM decisions that pass the TRC test, the one delivering the maximum net benefit should be selected. He contended that the objective of least-cost planning can only be achieved by selecting options that maximize total resource costs. Therefore, he concluded that DSM screening should not seek to maximize the benefit-cost ratio of the DSM portfolio of individual programs or measures. (Chernick direct, p. 27) Witness Reinke testified that Duke is convinced that the use of benefit/cost ratios provides the greatest net benefits per dollar

spent on DSM programs. (Tr. Vol. 1, p. 74)

Witness Chernick testified that Duke rejected options which apparently pass the TRC (such as the High Scenario non-residential lighting and motor programs) and implemented DSM options that did not pass the TRC test (such as the residential water heating load control and off-peak water heating - submetered programs). (Chernick direct, p. 15) Witness Chernick claimed that the Company rejected the high scenario cases on the basis of a single test: the present worth of revenue requirements (PWRR), which is another name for the Utility Cost Test. (Chernick direct, p. 16) However, Duke has not in other respects selected its DSM portfolios to minimize PWRR. He stated that Duke should suspend its load-building programs, such as the residential add-on heat pump and insulation - new residences, which generally increase PWRR, and Duke should suspend the uneconomical water heating programs. (Chernick direct, p. 14)

Witness Denton testified that while it is true that the Water Heater Load Control and Off-Peak Water Heating programs pass only the Participant test, these programs involve rate riders or schedules as approved by this Commission. He stated that Duke is actively working to determine whether these programs can be modified to be cost-effective. In the meantime, Duke is not actively marketing these programs to new customers. Customers are voluntarily participating in these programs and have invested money in the programs and should not be subjected to a sudden change or suspension prior to the Company thoroughly investigating

modifications to the programs. Witness Denton testified that Duke will notify the Commission of any proposed changes to the program. (Denton rebuttal, p. 11)

In his rebuttal testimony, witness Denton stated that Mr. Chernick is mistaken in stating that Duke rejected the high scenario motors and lighting programs because the programs failed the Utility Cost Test. Actually, the programs passed the Utility Cost Test but were not selected at this time because of additional risks associated with a much more aggressive DSM program. A major objective of the motors and lighting pilots will be to address the risks and uncertainties such as appropriate incentive level and participation level. (Denton rebuttal, p. 9)

The IRP procedures require consideration of transmission additions and improvements. Duke's IRP included a discussion of Duke's consideration of transmission system betterment. One witness presented testimony on power delivery efficiency opportunities.

Mr. Plett, representing Allied-Signal, testified that his purpose was not to criticize the IRP as filed by Duke but rather to discuss the potential benefit of economic power delivery investments and the importance of considerations of such investments in the IRP process. He further testified that amorphous metal distribution transformers could provide benefits to electrical customers in South Carolina and that the Commission should encourage economic utility investments. Amorphous metal transformers significantly reduce core losses when compared to

silicon steel core transformers. Generally the more efficient the transformer the higher the purchase price. The appropriate test is to compare "total owning costs" of transformers. Mr. Plett proposed the use of A and B factors in calculating the "total owning costs." (Tr. Vol. 3, pp. 112, 118, 119, 126, 131)

Duke's 1992 IRP states that Duke has pursued economical and efficient design in transmission and distribution facilities to ensure service reliability and needed operational flexibility. Along with capital, maintenance and other operation costs, the cost of losses associated with equipment and conductors have been considered when making system changes.

When Duke requests bids for distribution transformers, the vendors are supplied with the value to Duke of no-load losses and load losses (commonly called A and B factors in the industry). The vendor then quotes a price based on total owning cost of the transformer. The IRP further states that, to date, even though amorphous core transformers inherently have low loss characteristics, no vendor has quoted amorphous core transformers that have lowest owning cost. (Duke 1992 IRP, Vol. II, p. 29)

On cross-examination, Mr. Plett indicated that he is aware that Duke is presently utilizing amorphous core transformers on its system. He was not aware that Duke instructed manufacturers to bid amorphous core transformers in 1992. Mr. Plett also indicated that his calculation of benefits to South Carolina electric customers from the use of his Company's product did not include the capital cost of the amorphous core transformer. (Tr. Vol. 3, pp. 138, 141)

6. IRP Results

Witness Denton summarized the results of the 1992 IRP process. The IRP results in a mix of resource options which will provide an adequate, reliable supply of electricity to Duke's customers in a cost-effective manner. The IRP reflects cumulative demand-side capacity equivalent to 3689 MW by 2006. Duke's DSM plan is an aggressive plan which defers significant quantities of generating capacity over the 15-year planning horizon. The 1992 IRP characterizes an increase of 2000 MW of equivalent demand-side capacity over the 1989 IRP. (Tr. Vol. 1, p. 16) Witness Jenkins noted that by 2006 DSM is projected to contribute 64% of the additional system energy requirements. Concurrently, DSM will supply 47% of the system capacity resource additions over this 15-year period. (Tr. Vol. 1, p. 50)

Witness Denton testified that the IRP reflects operation of the Lincoln Combustion Turbine Station beginning in 1995. The IRP also calls for 1280 MW of additional combustion turbines in 2002 through 2005 and a 600 MW base load fossil unit in 2006. (Tr. Vol. 1, p. 16)

Witness Denton also testified regarding Duke's STAP (Section 12 of the IRP) which sets forth the necessary preparation to maintain a 1995 operation date for the Lincoln CT units. Duke will implement two new DSM programs, expand certain existing programs, and develop pilot projects for several additional demand-side options. Duke is also striving to expand the range of demand-side options for inclusion in future IRP processes. The Company is

performing a DSM resource assessment to identify the potential for DSM in the service area. While DSM options have expanded significantly in the last few years, Duke is pursuing more options for future IRPs. (Tr. Vol. 1, p. 19)

7. Pilot Programs

Witness Jenkins described the status of various pilot projects. Duke has recently completed three pilot projects. Duke has eight pilot projects underway and plans three new pilots as a result of the 1992 IRP. Witness Jenkins stated that Duke believes pilots can play a valuable role in the successful planning and implementation of DSM. He explained that pilot projects are undertaken to address the factors of uncertainty associated with demand-side options. Some examples of these uncertainties are costs, customer acceptance, load shape impact and technology performance. (Tr. Vol. 1, p. 51)

Witness Chernick testified that the Company has not demonstrated that its pilot programs are appropriate to a least-cost IRP. Pilot programs are justified to test innovative program designs and build the capability to produce program results. He noted that other utilities have implemented programs that offer many of the technologies Duke is piloting. Duke should attempt to pursue new DSM programs as full-scale demonstration programs rather than limited pilots. (Chernick direct, p. 78)

Witness Denton testified that Duke believes that pilots provide a valuable tool to clarify the uncertainties with DSM design and implementation, increase the chances of success, and

reduce risks. (Denton rebuttal, p. 5) Witness Jenkins stated that Duke plans to continue this valuable practice of piloting new demand-side concepts for those new options that need to be tested in the marketplace before system-wide implementation. (Tr. Vol. 1, pp. 51, 56)

Witness Denton also testified that it is difficult to directly transfer a DSM program from one utility to another. There are differences in customers, climates, system economics, and other factors that cannot easily or analytically overcome. Also, he testified that Duke has been involved in the energy marketplace for many years and has raised the service area's awareness of energy conservation. This awareness may increase the level of free-riders associated with a program, as opposed to an area where conservation and load management are relatively new. He noted that programs are only cost-effective if the avoided capacity and energy costs are greater than the costs as measured by the various tests. Duke's avoided capacity and energy costs are lower than many utilities. This situation further emphasizes the need for specific evaluation in the Duke service area. (Denton rebuttal, p. 5)

SCEUC witness Phillips testified that experience in other geographic areas under consideration must be explicitly modified to take these differences into account. He stated that it would be desirable to conduct experimental DSM programs to gain relevant experience before attempting to incorporate substantial DSM options into the IRP. (Tr. Vol. 1, p. 62)

8. Requests of the Parties Regarding Duke Power's IRP

Witness Chernick recommended that the Commission reject Duke's IRP and order the Company to institute a myriad of activities regarding Duke's DSM programs ranging from suspension of existing programs to redesign of all programs to provide as many measures as feasible to each market sector. (Chernick direct, pp. 90-91)

Witness Denton testified that Duke has set forth an integrated plan at a reasonable cost which meets its customers' energy and capacity needs with consideration of reliability, flexibility and the environment in compliance with the South Carolina IRP rules. (Denton rebuttal, p. 14) He also stated that the large majority of the Consumer Advocate's issues deal with changes to the future IRP processes. Integrated resource planning is a dynamic process and Duke is constantly looking at ways to improve its process. (Tr. Vol. 1, p. 30)

Witness Denton testified that Mr. Chernick's testimony implies that the Company should have DSM programs in place that address all potential areas of all markets at an unknown cost. He noted that the level of DSM reflected in the 1992 IRP is significantly greater than the level included in Duke's 1989 IRP (which was filed in North Carolina). The Company is increasing its involvement and investment in DSM with a focus on energy efficiency. Witness Denton stated his belief that the Company has developed a reasonable IRP which incorporates appropriate achievable DSM options. Mr. Denton noted that the Consumer Advocate's recommendations pertaining to DSM programs appear to be high risk

and have not yet been evaluated for cost-effectiveness. (Tr. Vol. 1, p. 31; Denton rebuttal, p. 1)

Additionally, witness Harper sought a generic proceeding so that the issues of fuel substitution and externalities, as well as other important policy issues could be addressed.

D. Cost Recovery Plan

In Docket No. 87-223-E, Order No. 91-1002, dated November 6, 1991, the Commission stated that "cost recovery plans may be filed by the utilities for the Commission's consideration, review and approval." Pursuant to that Order, the Company filed its proposed Cost Recovery Plan in this docket on May 22, 1992. Duke identified three components for consideration as allowable for cost recovery:

(a) revenue losses resulting from conservation programs;

(b) direct costs associated with implementation of DSM; and

(c) rewards for positive IRP accomplishments.

1. Revenue Losses

Duke is not seeking recovery of lost revenues at this time, but requests that it be allowed to seek recovery of lost revenues at such time that it becomes appropriate to do so. SCEUC witness Phillips argued that lost revenues and the recovery of lost revenues were not appropriate issues to be addressed in an IRP proceeding. (Tr. Vol. 3, p. 58) The Commission invited the utilities to file cost recovery plans and believes it is appropriate to address cost recovery issues in the IRP proceeding even though no rate recovery will occur until the decisions reached in this proceeding are reflected in a general rate case proceeding.

In response to concerns raised by the Commission Staff, the Company stated that the recovery of lost revenues is not related to a reward/shared savings mechanism. Duke argues that the recovery of lost revenues merely prevents a substantial under-recovery of DSM program costs. The shared savings mechanism on the other hand encourages DSM expenditures consistent with the State's Energy Act and NARUC Resolutions, supra.

2. Direct Costs

During the Company's most recent general rate case proceeding (Docket No. 91-216-E), Duke, the S. C. Department of Consumer Affairs, and the Commission Staff entered into a Stipulation dated September 23, 1991. One issue addressed in the Stipulation concerned the recovery of certain direct DSM costs. Specifically, the parties agreed that the Company could defer up to $6.475 million in DSM expenses above the 1990 test year level included in rates. The parties further agreed that carrying costs on the deferred balance would be computed monthly and added to the balance. The recovery of the balance in the deferred account would then be addressed in a subsequent general rate case proceeding. The parties also agreed that if the Stipulation were approved, the deferred account mechanism set forth therein would remain in effect until the Commission approved another plan. As outlined in the Company's Cost Recovery Plan filed May 22, 1992, further agreements and Commission orders ultimately set the deferred account cap at $10.173 million.

The Company has proposed in this proceeding that its Cost

Recovery Plan modify the deferred account mechanism approved in the rate case, thereby eliminating the cap on the deferred account. The Stipulation between Duke and the Commission Staff dated July 27, 1992 addressed several IRP issues, including DSM cost recovery. The Stipulation states that:

> The deferred account process as proposed within Duke's cost recovery plan with carrying cost coverage and subsequent cost of service amortization is an appropriate accounting mechanism to provide for recovery of DSM costs identified through the IRP process. Nothing in the cost recovery plan limits the Commission Staff's audit authority to review whether all costs deferred were reasonable and consistent with acceptable costs for inclusion in cost of service.

The Stipulation also set forth three criteria that should be met before recovery of DSM costs is appropriate:

(1) justification of the DSM resource option as to its cost-effectiveness;

(2) justification of reasonableness and prudent implementation costs incurred through an appropriate implementation process; and

(3) demonstration that the level of benefits achieved from the option is consistent with the approved IRP.

The Consumer Advocate recommended that Duke's cost recovery proposal be reviewed and amended. The Consumer Advocate did not make any specific amendments regarding Duke's Cost Recovery Plan. However, he did address several cost recovery issues. Mr. Chernick asserted that Duke's failure to screen several programs in the IRP should make those programs ineligible for cost recovery. (Chernick direct, p. 87) As stated in Mr. Denton's rebuttal testimony, the

Company did not analyze existing programs which did not experience significant changes in assumptions since they were analyzed in the 1991 IRP process and included in the 1991 STAP. In the future Duke does plan to analyze all DSM programs in its annual IRP process. (Denton rebuttal, p. 10)

Mr. Chernick asserted that deficiencies in documentation made a prudence determination impossible. (Chernick direct, p. 87) In his rebuttal testimony, Mr. Denton testified that Duke provided program information in Volume II of the IRP and provided over 180 pages of additional information in the appendices in Volume III. Duke also responded to numerous data requests from the Consumer Advocate and offered to make voluminous data available at its offices. (Denton rebuttal, p. 2)

SCEUC witness Phillips argued that no special cost recovery for DSM expenditures is required. Mr. Phillips testified that utilities have been incurring costs for conservation and load management since 1981 without any special form of cost recovery. Further, witness Phillips stated that special cost recovery is usually reserved for costs which are large in magnitude, volatile and largely beyond the control of the utility. (Tr. Vol. 3, pp. 65, 74) Duke acknowledged that it has had several programs, such as load control, in place for several years with no special ratemaking treatment in place. However, the Company pointed out that its DSM expenditures are projected to increase significantly and without a special recovery mechanism the Company will not be fully compensated for its increasing DSM costs. (Tr. Vol. 1, p.

90)

SCEUC witness Phillips also stated that DSM costs should be subjected to the same prudence standards as supply-side resources. (Tr. Vol. 3, p. 57) Duke witness Stimart in his direct testimony stated that the Company's Cost Recovery Plan as well as the IRP process itself provide for such checks and balances. (Tr. Vol. 1, p. 91)

3. Rewards/Shared Savings

Duke's Cost Recovery Plan includes a reward mechanism based on a shared savings approach. Witness Denton explained that Duke studied the various incentive mechanism that have been proposed or are in place around the country. These mechanisms include a return on DSM expenditures, increasing the utilities' return on equity based on projected or actual DSM accomplishments, and a sharing of the savings attributable to DSM programs. The Company concluded that the shared savings approach is the most appropriate incentive mechanism because it provides proper motivation to aggressively pursue cost-effective DSM. The shared savings proposal as set forth in Duke's Cost Recovery Plan provides 15% of the total savings attributable to the DSM program to the Company and its investors. The savings are the result of avoided capacity (kw) and energy (kwh) realized by utilizing DSM resources. The proposed calculation uses data from the IRP and is based on net benefits of DSM programs as identified in the IRP. The net savings are the difference between the costs of implementing the DSM option and the value of the avoided capacity and energy. The actual shared

savings will be based on verifiable accomplishments. (Tr. Vol. 1, p. 25)

The proposed reward calculation uses the present worth of savings based on the Utility Cost Test which is the test that identifies customer bill savings. The calculation uses projected DSM accomplishments and economic analysis principles to determine the savings per unit of DSM in present worth terms. The shared savings is calculated by multiplying savings per unit by actual accomplishments and by the appropriate shared savings percentage. The dollars of shared savings as achieved will be accrued as a component of cost included in the DSM deferral account. (Tr. Vol. 1, p. 26)

Duke witness Denton testified that approval of a shared savings mechanism is essential to encourage aggressive pursuit of cost-effective DSM. Mr. Denton stated, however, that with increasing demand-side expenditures, Duke's investors and the financial community foresee an uncertainty in the earnings potential of their investment without an incentive mechanism. Therefore, the financial community views with caution the industry's major shift in emphasis to DSM. Investors are looking to regulators for a clear signal that significant DSM investments are recognized as appropriate by regulators and will be afforded reasonable earnings opportunities. (Tr. Vol. 1, p. 23)

Witness Denton testified that many state regulators have recognized and taken steps to address this concern. A 1988 National Association of Regulatory Utility Commissioners' (NARUC)

resolution urged state commissions to "adopt appropriate mechanisms to compensate a utility for earnings lost through the successful implementation of demand-side programs and seek to make the least-cost plan a utility's most profitable resource plan."

Also, Duke witness Denton testified in rebuttal that the recently enacted South Carolina Energy Conservation and Efficiency Act of 1992 requires the Commission to:

> adopt procedures that encourage electrical utilities and public utilities providing gas services subject to the jurisdiction of the commission to invest in cost-effective energy efficient technologies and energy conservation programs. These procedures must provide incentives and cost recovery for energy suppliers and distributors who invest in energy supply and end-use technologies that are cost-effective, environmentally acceptable, and reduce energy consumption or demand. These procedures must allow energy suppliers and distributors to recover costs and obtain a reasonable rate of return on their investment in qualified demand-side management programs sufficient to make these programs at least as financially attractive as construction of new generating facilities. The Public Service Commission shall establish rates and charges that ensure that the net income of an electrical or gas utility regulated by the commission after implementation of specific cost-effective energy conservation measures is at least as high as the net income would have been if the energy conservation measures had not been implemented....
>
> S.C. Code Ann. §58-37-20 (Cum. Supp. 1992)

Witness Denton further testified that its Cost Recovery Plan, including the proposed shared savings mechanism, is consistent with the Commission's procedures and the South Carolina Energy Conservation and Efficiency Act of 1992. (Denton rebuttal, p. 13)

Mr. Chernick suggested that Duke's DSM programs are not sufficiently advanced to warrant any incentives or rewards.

(Chernick direct, p. 87) As discussed in the Company's Cost Recovery Plan and in Mr. Denton's direct and rebuttal testimony, one purpose of rewards is to remove disincentives for DSM investments and encourage aggressive pursuit of cost-effective DSM. Duke also noted that its 1992 IRP represents a significant commitment to DSM as a resource and represents a reasonable risk at this time.

SCEUC witness Phillips stated that incentive ratemaking is not an appropriate subject for the IRP and should not be allowed. He further argued that utilities should not receive an incentive payment for doing what they are supposed to do. (Tr. Vol. 3, p. 58)

One of the items addressed in the July 27, 1992 Stipulation between Duke and the Commission Staff was the Company's proposed shared savings mechanism. The Company and the Commission Staff agreed to modify the proposed plan. Rather than a shared savings based on 15% as proposed by the Company, the Stipulation calls for a 12% shared savings when at least a minimum of 75% of the projected accomplishments of a particular program are met. If the Company achieves 100% or more of the projected accomplishments, then the shared savings increases to 18%.

The Stipulation provides that the necessity for the continuation of the shared savings mechanism will be subject to review in the next IRP proceeding. However, the Company must justify the appropriateness of any shared savings mechanism in the next proceeding.

E. DSM PROGRAM EVALUATION PLAN

Witness Denton testified that Duke has established a formal DSM Program Evaluation Plan for 1992 DSM programs. Duke filed its DSM Program Evaluation Plan on May 22, 1992, and is seeking Commission approval of the plan and deferral accounting for associated expenditures as part of this docket. The purpose of program evaluation is to verify the actual demand and energy savings and to verify the cost effectiveness of the programs. Program evaluation will also assess program delivery, penetration, and acceptance in order to refine the programs. (Tr. Vol. 1, p. 21)

The Commission Staff and Duke stipulated that Duke's proposed DSM Evaluation Plan as filed on May 22, 1992, is appropriate for evaluating demand and energy savings and to provide necessary feedback on DSM programs. The Company agreed to periodically review the process to ensure that it meets the Plan's objectives with the most reasonable costs. The Stipulation is addressed in Section IV, Finding and Conclusions, Part A.

F. DEMAND SIDE BIDDING

Witness Jenkins testified that Duke has a demand-side bidding project underway to determine the feasibility of using a competitive procurement process to acquire DSM resources. Customers and third-party energy service companies will be able to submit proposals to design and implement DSM programs in Duke's service territory. (Tr. Vol. 1, p. 47) On August 10, 1992, Duke filed its DSM bidding RFP program with the Commission. The filing

stated that the primary goals of the project are to gain experience in working with customers and third-party providers for demand-side proposals and to assess the opportunities in the marketplace for this DSM option. Duke is seeking to acquire approximately 25 MW of DSM resources from the RFP. Contracts are scheduled to be awarded by September 30, 1993.

Duke identified DSM bidding as a future resource option in the STAP (Section 12) of the 1992 IRP. Proposals will be evaluated using the IRP process and be identified as cost effective prior to contracts being awarded. Duke proposed deferring the South Carolina portion of the costs associated with the DSM bidding program.

Witness Denton testified that Duke believes the best way to address the industrial market segment may be through customer-designed programs. This concept is a major thrust of Duke's DSM bidding program. Industrial customers are in the best position to identify many unique DSM opportunities. (Denton rebuttal, p. 4)

South Carolina Pipeline witness Harper testified that bidding programs, including both DSM and supply-side resource options have increasingly become more appropriate for electric utilities to use in making short-term and long-term resource planning and acquisition decisions. However, witness Harper was critical of Duke for excluding natural gas-related DSM options in its DSM bidding program. Mr. Harper stated that the Commission should direct the Company to change its corporate policy in this regard. (Tr. Vol. 3, p. 19)

Duke has committed to review the proposals and their

evaluations with the Commission Staff as the results are obtained. Duke will file a summary of the proposals with the Commission, including expected capacity and energy savings as well as total program costs following evaluation and selection of proposals. Duke noted that this information will be confidential due to the nature of the competitive bidding process. Duke has committed to provide additional information on program costs including itemized proposed charges to the DSM deferral account over the life of the program.

IV.

FINDINGS AND CONCLUSIONS

Based upon consideration of the foregoing, the Commission makes the following findings of fact and conclusions of law:

A. STIPULATION BETWEEN DUKE POWER AND THE COMMISSION STAFF

The Stipulation between Duke Power Company and Commission Staff addresses several major issues of Duke's IRP filing. The Commission agrees with most aspects of the Stipulation. Consistent with the Stipulation, the Commission finds that Duke's 1992 IRP is consistent with the South Carolina IRP procedures set forth in Order No. 91-1002 in Docket No. 87-233-E.

However, the Commission finds that it does not fully concur in Paragraph 5 of the Stipulation. Specifically, the Commission does not agree that "IRP approval means that the Commission has determined Duke has developed an IRP which is consistent with the objective statement and procedures set forth in the IRP Order." Rather, the Commission, in determining the proper policy for "approval" of any utility's IRP, is of the opinion a review of the

procedures set forth in Order No. 91-1002 is necessary. Order No. 91-1002 states that "at the conclusion...the Commission will determine whether the IRP filed by each utility is reasonable at that point in time...." Order No. 91-1002, Appendix A, p. 2. Thus, the Commission must only determine the "reasonableness" of an IRP at that point in time, not "approve" an IRP. Therefore, the language of the Stipulation should be changed to read in Paragraph 5 that

> A Commission finding of reasonableness means that Duke has developed an IRP which is consistent with the objective statement and procedures set forth in the IRP Order.

Similarly, the language dealing with the resource options in Paragraph 5 should read as follows:

> With regard to the resource options incorporated within the plan, a Commission finding of reasonableness means: a) that the resource options included within the plan should satisfy the projected energy requirements of the Company's customers given current information and assuming proper implementation; b) the Commission will monitor the costs incurred in the implementation of each option as to the reasonableness and prudence over time and will monitor the implementation process as to its appropriateness.

Thus, a finding of reasonableness by the Commission indicates that the Commission believes that the Company made a good faith effort to comply with the established procedures and the objective statement of Order No. 91-1002. A finding of reasonableness does not constitute either pre-approval of costs or prudency for full cost recovery for the resource options included in the IRP.

Paragraph 6 of the Stipulation deals with recognizing that a

cost recovery plan for recovery of costs incurred from implementing DSM programs is appropriate to consider in an IRP proceeding. The Commission agrees. A stated plan for cost recovery may be outlined in an IRP filing. Of course, the issues of rate design and cost of service allocations would be addressed in a subsequent rate case.

While the Commission finds that the language of Paragraph 6 is appropriate, the Commission finds that the following language should be added and would better state the Commission's views:

> The appropriateness of the full costs related to the resource options will be determined during future proceedings. Resource cost recovery must be consistent with existing procedures for supply side options while DSM options must comply with the procedures set forth through the IRP process. The IRP process established by Order No. 91-1002 was not intended to modify the existing regulatory procedures already established for supply-side options. Thus, existing supply-side options already in service or under contract are treated as given for purposes of the Commission's evaluation of the plan. The IRP process was designed in part to encourage consideration of DSM options by establishing a mechanism to evaluate and incorporate such options within the utility planning process.

The specifics of Duke's cost recovery plan will be discussed infra.

The treatment of the costs for DSM programs incurred up to the time of cost recovery was outlined in Paragraph 7 of the Stipulation. Specifically, a deferred account process, as outlined in Duke's cost recovery plan, including elimination of the cost recovery cap, was agreed upon by Duke and the Staff. Deferral accounting treatment would allow for carrying cost coverage and subsequent cost of service amortization. The Staff, however, would not be restricted in its audit authority to review whether all

costs deferred were reasonable and consistent with acceptable costs for inclusion in cost of service. The Commission finds that the provisions of Paragraph 7 are appropriate and should be utilized for the purpose of Duke's IRP.

Paragraph 8 sets forth the criteria that Duke must meet before it may recover DSM costs. It is the utility's burden to justify the cost-effectiveness of each DSM resource option in its IRP. The Stipulation sets forth the criteria the Company must include to justify the DSM options. Additionally, the Stipulation states that justification of reasonableness and prudent implementation costs incurred through an appropriate implementation process must be shown by the utility. Moreover, the utility must demonstrate that the level of benefits achieved from the option is consistent with the IRP or justify any deviation from the IRP.

The Commission has considered these provision of the Stipulation and finds that it is appropriate for the Company to provide proper justification before any cost recovery may be allowed by the Commission. Therefore, the provisions of Paragraph 8 are approved.

Paragraph 9 of the Stipulation addresses shared savings. The Commission is of the opinion that the proposal outlined in the Stipulation is consistent with S.C. Code Ann. §58-37-20 (Cum. Supp. 1992), and the NARUC Resolution in Support of Incentives for Electric Utility Least-Cost Planning. While the Stipulation states that the Staff believes that the shared savings concept should be a temporary measure used to encourage the Company to actively pursue

DSM options which achieve cost effective energy savings and efficiencies, the Commission will review the necessity to continue the shared savings mechanism in the next IRP Docket. Until then, the Commission finds that the shared savings mechanism as outlined in Paragraph 9(a) and (b) is consistent with State law and with the regulatory policy enunciated by NARUC. Therefore, the Commission finds reasonable the shared savings mechanism consistent with the Stipulation.

The Commission has considered the language of Paragraph 13 of the Stipulation, as well as the proposal of SCPC regarding fuel switching. The Commission agrees that it is not necessary to address the impact of fuel switching on other energy suppliers in this docket at this time. SCPC suggested that a generic proceeding to "develop uniform guidelines for considering fuel substitution opportunities." The Commission is of the opinion, however, that it is more important to get the electric utilities to implement their respective IRP's and proceed with this process than to introduce another element which is, at this stage, controversial, uncertain and complex. At this point in time, electric utilities should not be required to consider natural gas DSM options, neither should gas DSM options be required in the Company's DSM Bidding Program. Therefore, the Commission will not require a generic proceeding be established at this point in time, but will continue to monitor the issue.

B. DUKE POWER'S STIPULATION WITH THE CONSUMER ADVOCATE

The Commission has reviewed the Stipulation between Duke Power Company and the Consumer Advocate and the provisions thereof. Duke has committed to certain things sought by the Consumer Advocate. The areas of concern were addressed in the testimony of Chernick, and rebutted by Duke in the testimonies of Denton, Jenkins and Reinke, primarily. It appears to the Commission that Duke has addressed the Consumer Advocate's concerns in the Stipulation, and its testimony was persuasive for the purpose of this proceeding. The Stipulation allows for new or modified DSM program filings, along with certain information. The Commission believes this to be an appropriate avenue for the Company to follow before implementing any new DSM programs or modifying any existing programs. In fact, the Commission will outline an interim filing procedure, infra. Therefore, the Commission finds that the Stipulation between Duke and the Consumer Advocate should be approved. With that, witness Chernick's suggestion that Duke's IRP be rejected is deemed moot.

C. DUKE'S IRP

Duke's IRP process has established an appropriate resource mix including appropriate DSM programs and the resource mix is found to be reasonable by the Commission. The forecast used for the 1992 IRP is reasonable. Duke's demand-side, supply-side, and purchased resource planning processes are appropriate and reasonable. Duke's integration process is appropriate and results in a reasonable integrated resource plan.

Duke witnesses addressed the impact of the CAAA and the issue

of environmental externalities. The Consumer Advocate's witness testified that Duke had not adequately incorporated the value of CAAA allowances. Duke pointed out that it is not required to comply with Title IV of the CAAA until 2000 and will further consider CAAA allowances as the market develops. Therefore, the Commission finds that Duke has adequately considered the CAAA by incorporating a preliminary compliance plan.

The Consumer Advocate and South Carolina Pipeline contended that Duke had not adequately considered environmental externalities in the IRP process. The Commission notes that several witnesses stated that there are numerous views on the proper method to address externalities. Duke testified that it includes the cost of environmental compliance in the assessment of resource options and qualitatively considers environmental effects in resource assessments. The Commission finds this is a reasonable approach at this time and consistent with Order No. 91-1002, but will continue to monitor the issue. Therefore, there is no need for a separate proceeding at this time.

Duke considers utility and non-utility generators including qualifying facilities under PURPA and independent power producers. No intervenor raised issues related to Duke's purchased resource planning. Based on the evidence, the Commission finds that Duke's purchased resource planning process is appropriate and reasonable.

The Commission further finds that Duke should continue to pursue power delivery efficiencies, such as amorphous metal transformers, where such is cost effective.

Duke described a process by which it integrates demand-side, supply-side and purchased resources as well as transmission betterment into its integrated resource plan. Duke tests the plan under a number of scenarios to select a plan which is viable under a wide range of uncertainties. The Consumer Advocate was critical of Duke's integration process and particularly critical of Duke's use of multiple tests in determining the cost-effectiveness of demand-side options. The Commission finds that use of multiple tests is consistent with the IRP rules and is therefore appropriate. The Commission also notes that while the Consumer Advocate is critical of Duke not screening certain existing options, Duke has committed to screen all existing options in future IRPs. Based on the evidence, the Commission finds that Duke's integration methodology is appropriate and reasonable.

The Commission concludes that Duke's IRP is consistent with the Commission's stated objective for the IRP process and the Company has made a good faith effort to comply therewith. Based upon the information available at this time, Duke's IRP is appropriate and reasonable to meet the needs of its electric customers in an economical, efficient and reliable manner.

D. PROCEDURE FOR FILING NEW OR MODIFIED DSM PROGRAMS

Consistent with the recommendation of the Consumer Advocate agreed to by Stipulation with the Company, the Commission will herein outline the procedures to be followed by the Company and the parties to the instant Docket regarding any new or modified DSM program sought to be implemented. The overriding concern of the

Commission is that Staff and the parties be given the necessary information in a timely manner by the Company so that the Staff and the parties have an understanding of the new or modified program. The parties should be allowed to discuss any issues with the Company, and a good faith effort should be made by all to resolve any disputed issues within the allotted time frame. Once an appropriate review has been conducted, the Commission will make the necessary findings to enable the Company to proceed with the implementation, including the deferral of appropriate costs. This procedure will not prejudice the right of any party to question the appropriateness of the DSM programs or their related costs in the future. Moreover, the Company must still comply with the cost recovery requirements set forth herein.

The procedure will be as follows:

1. Filings with the Commission of new or modified DSM programs for evaluation of their reasonableness and cost effectiveness shall be provided to parties of the existing docket. These filings will provide the Commission, the Staff, and the parties of record with information on the proposed new or modified DSM programs.

2. The Staff will provide a list of minimum filing requirements to Duke for new or modified DSM program filings. Minimum requirements to be filed with any new or modified program are attached in Appendix A and may be modified from time to time by the Staff.

3. The Company will meet with any interested party of record

at the request of the party to discuss the new or modified DSM program. The parties will have 60 days to resolve any issue.

4. At the end of the 60-day period, the Staff will present the new or modified DSM program to the Commission. If there are unresolved issues, any party may present its position to the Commission for resolution. After resolution by the Commission, the Commission will issue a decision. A Commission finding that the Company has adequately demonstrated that the program is reasonable and cost-effective based on the Company's current best estimates and consistent with the IRP procedures and the requirements set forth within this Order will allow the Company to:

a) proceed with implementation of the DSM program as filed, including payment of customer incentives, if any, and

b) include the specified DSM costs in the previously approved deferral account.

A Commission decision allowing implementation of a DSM program does not prejudice the right of any party to question the appropriateness of the DSM programs or their related costs in any future proceeding. The IRP procedures require that at the time of cost recovery, the utility must also comply with the requirements established within this Order.

E. COST RECOVERY PLAN

Commission Order No. 91-1002 in Docket No. 87-223-E provided that Cost Recovery Plans may be filed by the utilities for Commission consideration, review and approval. Duke filed its Cost Recovery Plan (Hearing Exhibit 4) in May 1992 in response to that

Order. The Stipulation between the Staff and Duke dated July 27, 1992 addressed, among other things, the issues of deferral accounting and a shared savings mechanism. Those issues have been previously approved herein.

However, the Commission is concerned about approving, as proposed, the Cost Recovery Plan. In essence, the Commission shares the view of the Consumer Advocate that Duke seems to seek to establish some sort of finding of "prudency" from the inception of a DSM program. That is not the Commission's intention. In fact, Duke has agreed through its Stipulation with Staff that it must justify the DSM resource option by the utility as to its cost-effectiveness, justify the reasonableness and prudent implementation costs and demonstrate that the level of the benefits achieved from the option is consistent with the approved IRP before any cost recovery is allowed by the Commission. The "prudency" language of the Cost Recovery Plan is inconsistent with the approved Stipulation. Therefore, Duke's Cost Recovery Plan will not be approved as filed. However, portions of the Plan have merit.

The Commission is in agreement with Duke for the most part, concerning the section on the cost components of the integrated resource plan. However, the language dealing with the implementation of individual DSM programs and the filing of such programs with the Commission should be changed to state the following, consistent with the Commission's findings.

> Prior to implementation, individual DSM programs will be filed with the Commission for (1) a finding of

> reasonableness of the program at that point in time, and (2) authorization of deferral accounting for the specified expenditures associated with the program consistent with those reflected in the IRP and the STAP's. The nature of the costs to be deferred will be limited to expenditures consisting of payments or credits to customers, advertising payments and such other payments to outside parties (either customer or vendor) as approved by the Commission.

Following implementation of DSM programs, evaluations will be conducted to verify electric load shape impacts, costs for the programs, customer participation, and net benefits.

The Commission also finds that the language concerning the history of current cost recovery provisions contained in the cost recovery plan filed by Duke Power is dicta and strictly for informational purposes. As to the proposed cost recovery plan section of the filing, the Commission will approve the first step of the process by modifying the language to state the following: Commission's finding of reasonableness at that point in time of Duke's IRP and the associated DSM programs.

The provisions of the Commission Staff's Stipulation with Duke Power concerning the justification and demonstration of the cost effectiveness and benefits would be applicable for the recovery of the dollars expended for the DSM programs. The Commission will approve steps two, three, four, five, six (consistent with the rewards mechanism approved through the Stipulation between the Commission Staff and the Company), and seven of the Cost Recovery Plan. By approving step five, which authorizes the Company to seek and justify recovery of revenue losses when it becomes appropriate,

the Commission is not committing that it will approve such revenue losses, only that the Company may seek to recover them and the other parties may present their positions on the matter for the Commission's consideration.

The Commission does not approve the language concerning approval of this cost-recovery plan on page four of the cost-recovery plan which seeks to state that approval establishes the prudency of any dollars booked to date or determined to be cost effective.

On page four of the cost-recovery plan, Duke submits the meaning of IRP approval. However, the Commission has previously addressed that in the section concerning the Stipulation between Duke Power and the Commission Staff. That finding will prevail as previously discussed. The section of the cost-recovery plan dealing with the deferral account as proposed by Duke Power is consistent with the Commission's understanding and should be approved for the purposes of this IRP proceeding.

The section of the cost-recovery plan dealing with the rewards mechanism is addressed in the Commission Staff's Stipulation with the Company, and the Commission approval of the Stipulation dealing with the rewards mechanism will supersede the rewards mechanism filed for by Duke Power in its cost-recovery plan. Additionally, Duke filed for carrying costs to be computed monthly and added to the balance of the deferred account, compounded annually. The carrying cost rate will be equal to the rate of return approved by the Commission in Duke's most recent rate case. The Commission is

of the opinion that it is appropriate that Duke be allowed to recover the carrying costs of the deferred balance between cost recovery requests.

F. DSM PROGRAM EVALUATION PLAN

Duke filed a DSM Program Evaluation Plan (Hearing Exhibit 5) on May 22, 1992 in this docket. The July 27, 1992 Stipulation between Duke and the Commission Staff established that Duke's DSM Program Evaluation Plan is appropriate for evaluating demand and energy savings and to provide necessary feedback on DSM programs. The Commission finds the proposed Evaluation Plan is appropriate and reasonable.

G. DSM BIDDING RFP

Duke filed its DSM bidding RFP program on August 10, 1992. The filing stated that Duke is seeking to acquire approximately 25 MW of DSM resources to gain experience in working with customers and third-party providers of demand-side proposals and to assess the opportunities in the marketplace for this DSM option. Duke has committed to review the proposals and evaluations with the Commission Staff and file a summary of the proposals with the Commission. Duke has also committed to file additional information

on program costs. The Commission finds the proposed demand-side bidding RFP is reasonable. Deferral accounting for the associated expenditures is appropriate.

IT IS SO ORDERED:

Chairman

ATTEST:

Executive Director

(SEAL)

FILING REQUIREMENTS FOR INTERIM DSM PROGRAMS

a. Description of program
b. Specific program objectives
c. Description of targeted sector
d. Program service life
e. Total market potential (number of potential customers or other relevant measure)
f. Expected saturation to be achieved, including anticipated market growth throughout the life of the program.
g. Summer/Winter expected on-peak demand change per unit (customer, etc.)
h. Annual energy change per unit.
i. Calculation of any estimated lost revenues. Explain how such lost revenues were determined.
j. Calculation of any net lost revenues resulting from the option which are to applied to the deferred account or will be sought in any way for recovery.
k. Magnitude of expected load shape impacts (kw/kwh). Sources of expected load shape impacts. Identify the type of program such as peak clipping, valley filling, conservation, load shift or other. Describe the method used to estimate potential impacts
l. Total program cost estimates on a present worth basis (itemized and quantified) [Annual data may be provided upon request].
m. Total program benefit estimates on a present worth basis. (itemized and quantified) [Annual data may be provided upon request].
n. Sources of cost/benefit data
o. $/kw saved and $/kwh saved
p. Test results including:
    i. utility cost test results
    ii. total resource cost test results
    iii. rate impact measure test results
    iv. other tests necessary to evaluate the program
q. Explain which test(s) were most appropriate to evaluate the option and why
r. Customer/vendor incentives expected to be paid, their purpose and how the incentives were derived
s. Itemized proposed charges to DSM deferred account over the life of the program
t. Other known expenses itemized over the program life
u. Calculation of any proposed rewards to be obtained by the company
v. Proposed program evaluation methodology-including planned load research methods.
w. Marketing strategies-including examples of any marketing media to be employed
x. Potential program problem areas considered.